

**WHAT IS CLAIMED IS:**

1. A decoding power aware encoding method for generating a predictively encoded data stream, in which predictions, that result in a reduction in the amount of data transferred from the secondary memory to primary memory during the decoding process, are favored, said method for favoring certain predictions comprising:

- (a) a model for transfer of data from secondary memory to primary memory in the decoding process;
- (b) a scheme for weighting the relative merits of favoring a certain prediction and the associated loss in compression gain, and
- (c) based on said weighting scheme, choosing a particular prediction from the candidates allowed by the compression scheme.

2. A power aware decompression method for decoding a predictively encoded data stream, comprising:

- (a) generating a first selection signal which signals whether the data to be used for prediction resides in primary memory in part or in whole;
- (b) if the first selection signal indicates that a portion of the said prediction data or the whole of the said prediction data is not present in primary memory:
  - i. generating a second selection signal, based on an estimate of the future needs of the prediction process, to signal that portion of the primary memory where the prediction data, which is not

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3. A method for decoding a coded data stream comprising:

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4. A system for decoding a coded data stream comprising:

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(a) a processor for outputting the decoded data frames;

(b) an external memory;

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(d) a memory management scheme for decreasing the amount of traffic to the external memory so as to provide better real-time performance and power saving by a connection arrangement for transmission from the processor to the external and internal memories.

5. A system as defined in claim 4, wherein said internal primary memory is dedicated to the motion compensation function of data decoding.

10 6. A system as defined in claim 4, wherein the processor receives the data stream at its input, and has output respectively connected to the external and internal memories and a further output providing decoded data frames.

7. A system for decoding a coded data stream comprising:

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(a) a processor for outputting decoded data frames;

(b) motion compensation means having a memory for storing a reference data frame as well as a data frame being decoded currently;

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(c) an external memory;

(d) an internal primary memory having high speed access relative to the external memory, and

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(e) wherein said internal primary memory is dedicated to the motion compensation function of decoding.

8. A system for encoding an input data frame comprising:

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- (a) a motion estimator for receiving an input frame and for searching to find the best match between an input frame and an area in a reference frame;
  - (b) a primary memory model coupled to the motion estimator;
  - (c) a motion vector selector coupled to the output of the motion estimator;
  - (d) a memory for storing data reference frames, and
  - (e) a quality and rate controller coupled to the motion vector selector.
9. A system for encoding a data frame as defined in claim 8 further comprising a motion vectors module for determining the motion vectors based on the current block and the best matched candidate.
10. A program memory medium for controlling a system that decodes a coded data stream, the memory medium comprising:
- (a) controlling the processing of a coded data stream to produce outputted data frames;
  - (b) controlling the transmitting of signals to, and receiving signals from, a high speed primary memory for storage and retrieval of data frames being decoded currently;
  - (c) controlling the transmitting of signals to, and receiving signals from, a secondary memory, and
  - (d) controlling the amount of traffic to the external memory.